

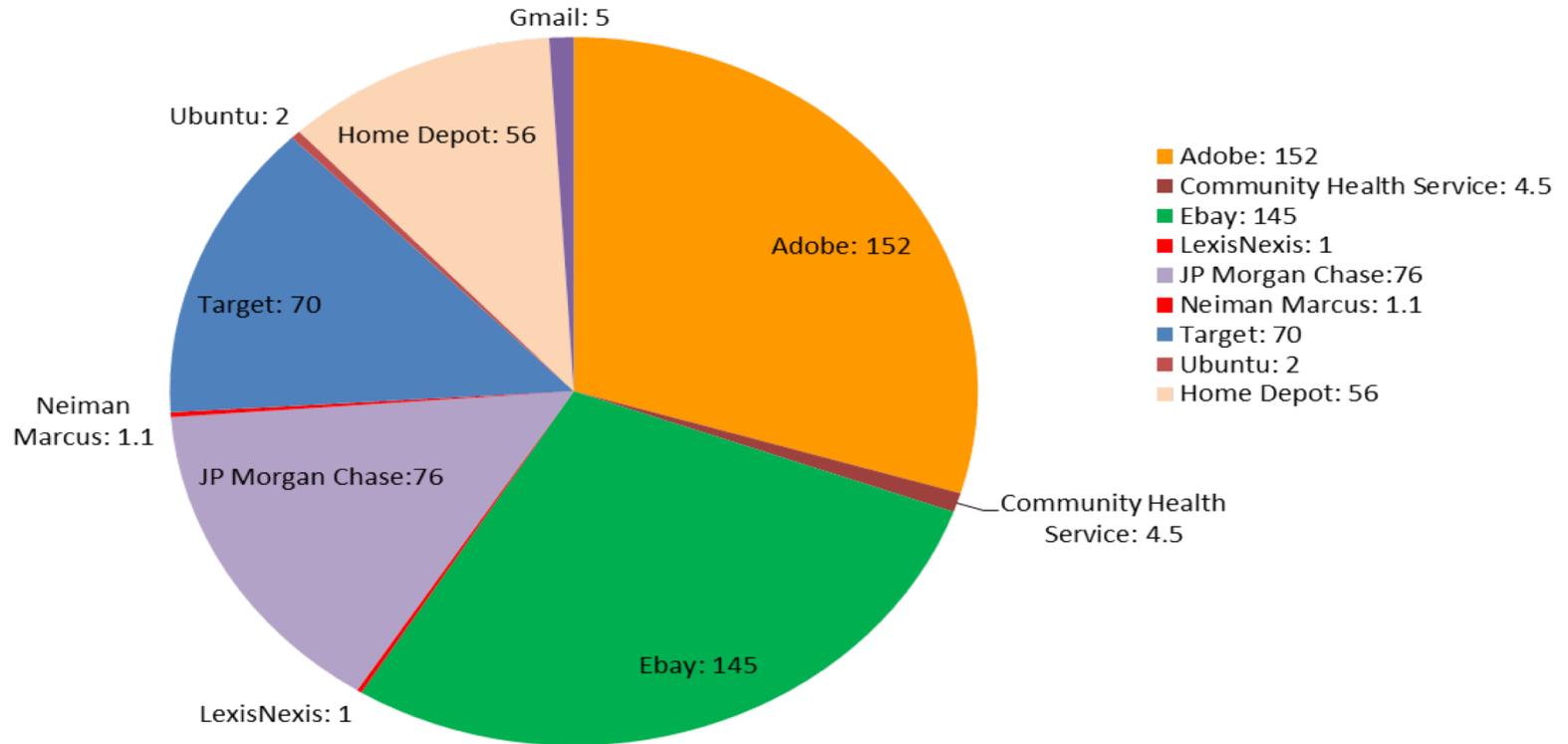
Cybersecurity Training Framework

Presented by Dr. Sherry Lakes

**Federal Information Systems Security Educators Association (FISSEA)
Annual Conference
14-15 March, 2018**

Background

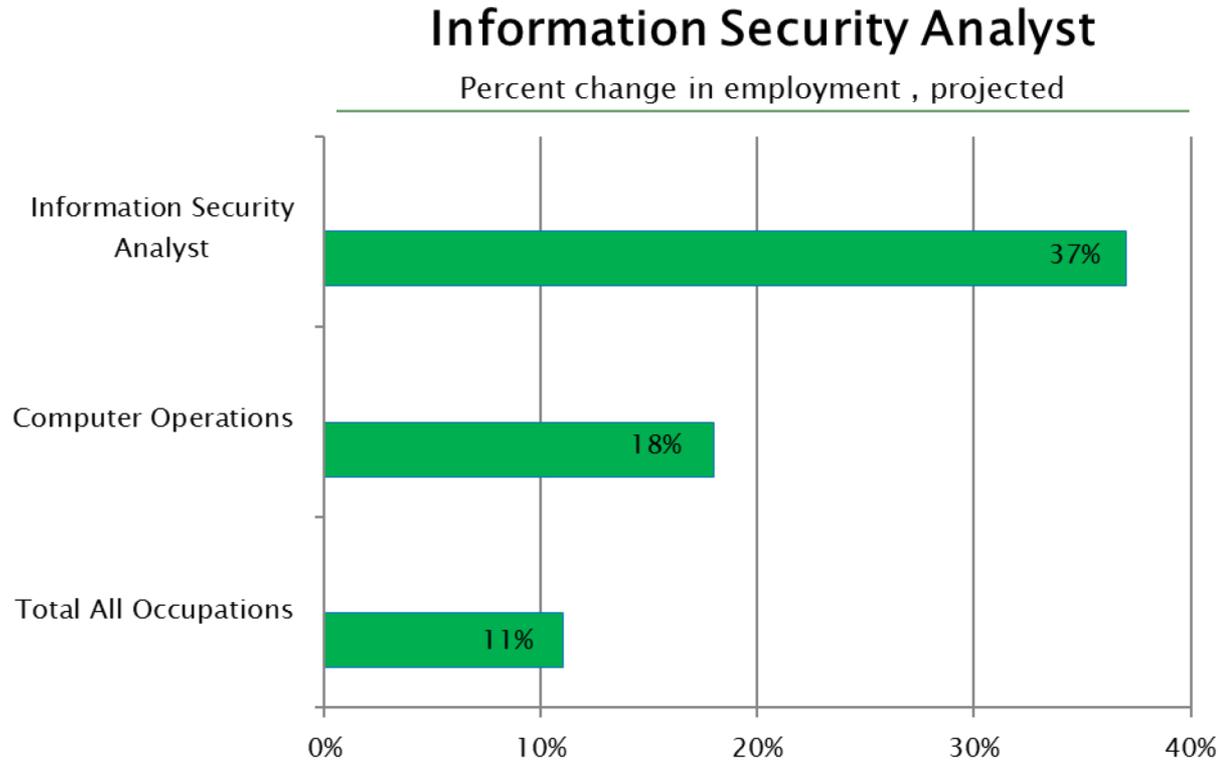
Biggest *Known* Data Breaches of 2013 and 2014



Cybersecurity Initiatives

- ▶ Education
 - FISSEA
 - NICE
- ▶ Policy
 - Executive Orders
 - Publications
- ▶ Technology
 - Firewalls
 - Secure Token Services

Cybersecurity Professionals (Projected Need)



Note: All Occupations include all occupations in the U.S. economy.

<http://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm#tab-6>

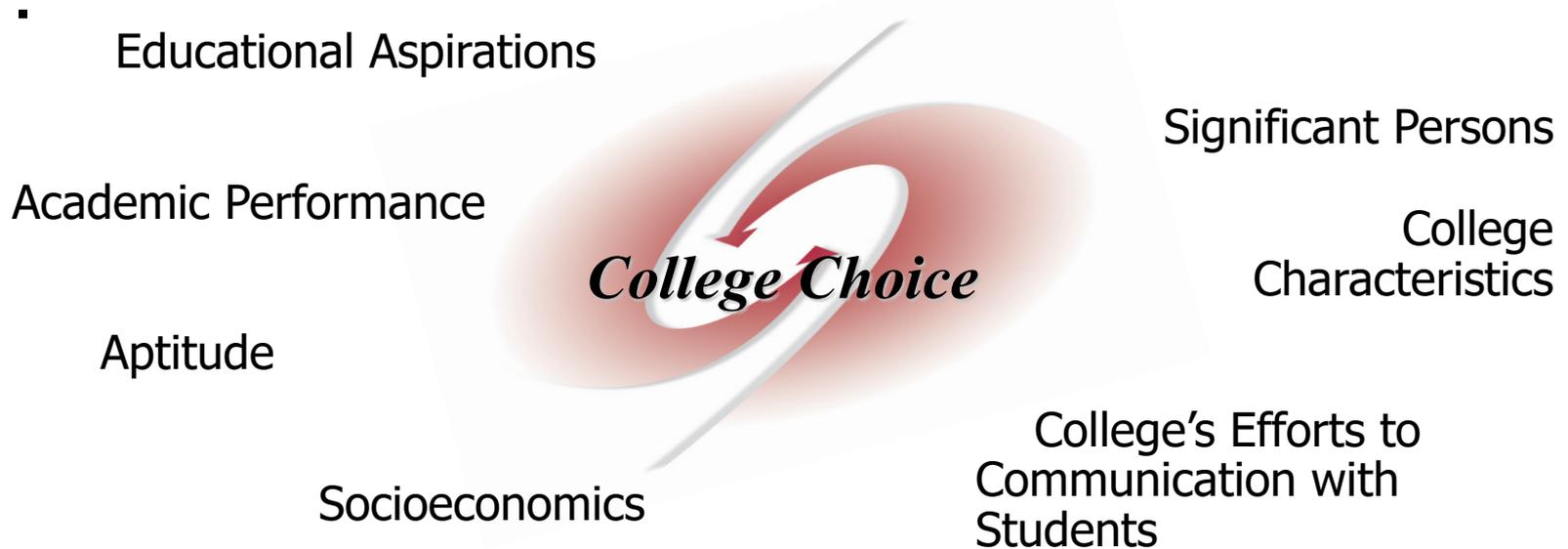
Cybersecurity Professionals (Increased Demand)

- ▶ Increased the demand for cybersecurity professionals
- ▶ Shortage of cybersecurity professionals has caused cybersecurity-related job openings in U.S. companies to go unmet
- ▶ Potentially negative impact of the shortage of cybersecurity professionals

Cybersecurity Professionals (Resolution)

- ▶ Instructor
 - What they know
- ▶ Student
 - Who wants to know
 - What they want to know

Chapman's Model of Students' College Choice



****Career Objectives** are not part of Chapman's model

Cybersecurity Professionals (Student)

- ▶ Who wants to know
 - Novice
 - Experienced
 - Leadership

- ▶ What they want to know
 - General
 - Focused Area
 - Certification

Cybersecurity Professionals (Student)

Course		Student		
		Decision-Maker	Practitioner	Novice
Objective	Certification			
	Focus Area			
	General			

Traditional Approach

- Preconditions
- Assumption/Compliance
- Objectives
- Rigid
- Commonality
- Delivery

Alternative Approach

- ▶ Enduring Framework
 - Impact Levels
 - Threats, Risk, Mitigation
 - Consistent
 - Reciprocal

Cybersecurity Professionals (Instructor)

- ▶ **Capability**
 - Novice
 - Experienced
 - Style

Why a Framework

- ▶ A framework is always used
 - Informal or formal
 - Inside a SME's head
 - Ad-Hoc

Proposed Use of a Formal Framework

- ▶ Assess Effectiveness prior to delivery
- ▶ Documented
- ▶ Repeatability
- ▶ Consistency
- ▶ Formally agreed upon
- ▶ Understood by Stakeholders

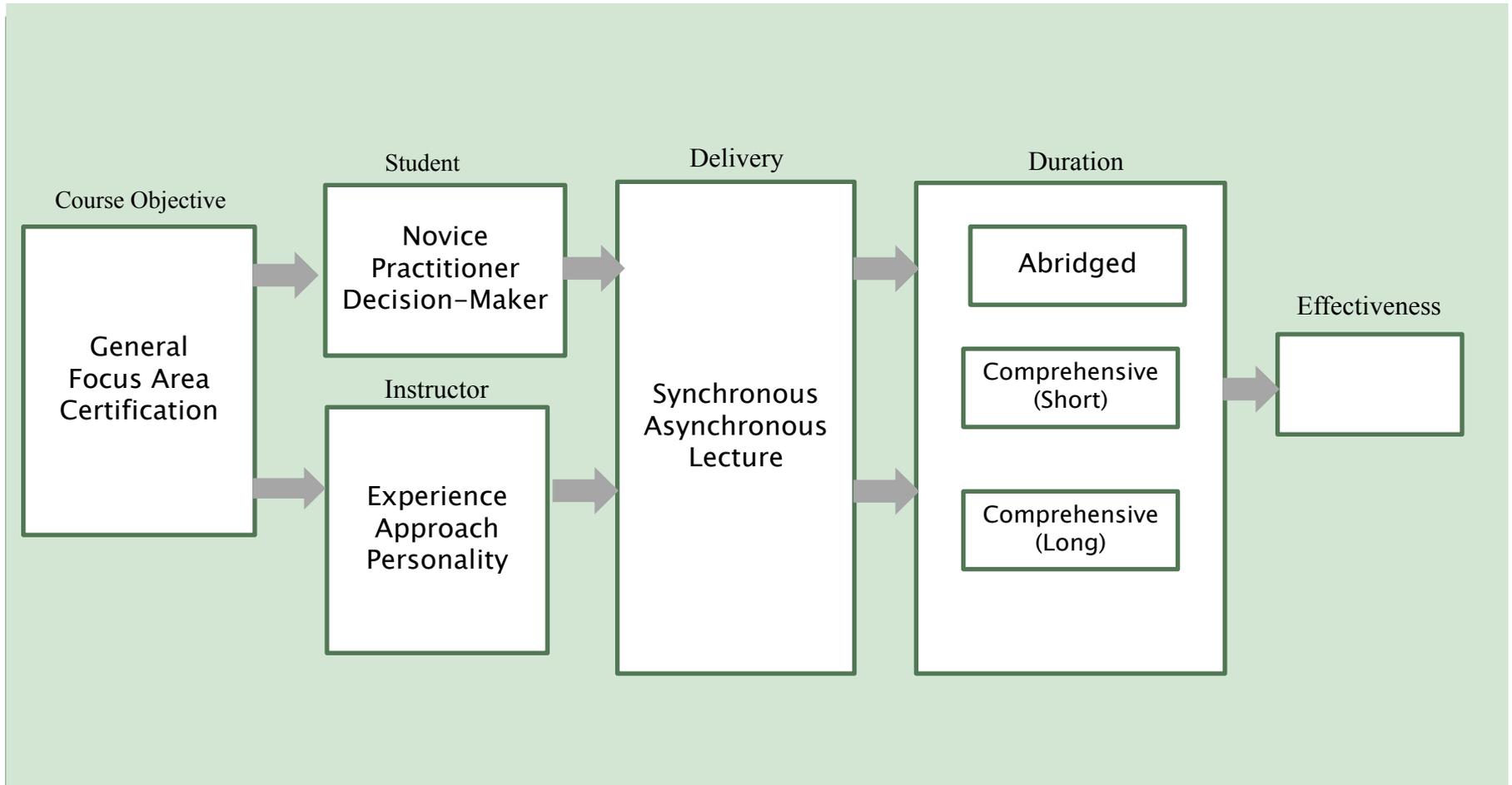
Example Formal Framework

- ▶ ADDIE Model:
 - Analysis
 - Design
 - Development
 - Implementation
 - Evaluation

Example Formal Framework

- ▶ Kirkpatrick's Four-Level Training Evaluation Model:
 - Reaction
 - Learning
 - Behavior
 - Results

Cybersecurity Training Framework



Framework Structure

- ▶ **Category of Concern**
 - similar groupings of elements to simplify analysis, and provide longevity to the model
- ▶ **Each Category of Concern is defined by a set of Attributes**
 - characteristics of the elements categories
- ▶ **Each Attribute is rated on a scale, based on an Axiom related to the Attribute**
 - Minimal Effectiveness Rating is derived from aggregate of attribute ratings

“Millennials tend to use social media more than baby-boomers”

Rating Table

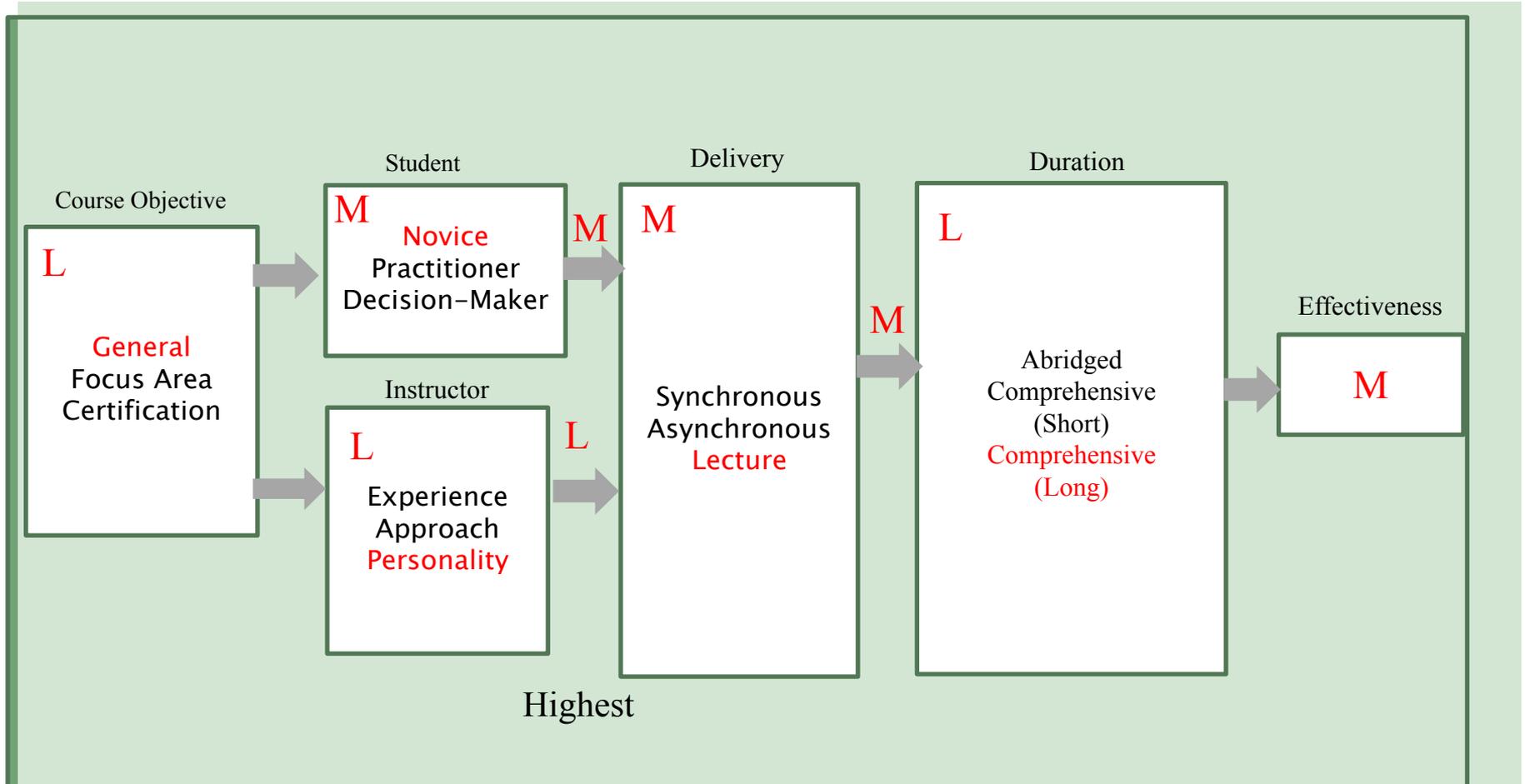
Rating (Importance)	Category/Attribute				
	Objective	Student	Instructor	Delivery	Duration
High	Focus	Practitioner	Experience	Asynchronous	Abridged
Medium	Certification	Novice	Approach	Lecture	Comp (Short)
Low	General	Decision-Maker	Personality	Synchronous	Comp (Long)

Rating (Importance)	Attribute		
	High	Medium	Low
High	H	M	M
Medium	M	M	M
Low	M	M	L

Use Case

Rating (Importance)	Category/Attribute				
	Objective	Student	Instructor	Delivery	Duration
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Implementation Guidance



Way Forward

- ▶ Increased Demand for Cyber Professionals
- ▶ More Effective Training
 - Repeatable
 - Consistent
- ▶ Collect actual use cases
- ▶ Determine baseline importance weights
- ▶ Automate Framework Calculations
- ▶ Augment Framework with more granularity

THANK YOU!!!

Sherry Lakes
info@genesys-inc.com
301.520-0477